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Geographic Variation in Health Service Use and Perceived Access Barriers for Australian Adults with Chronic Non-Cancer Pain Receiving Opioid Therapy

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Abstract

Objective. Rates of chronic non-cancer pain are increasing worldwide, with concerns regarding poorer access to specialist treatment services in remote areas. The current study comprised the first in-depth examination of use and barriers to access of health services in Australia according to remoteness. Methods. A cohort of Australian adults prescribed pharmaceutical opioids for chronic non-cancer pain (n = 1,235) were interviewed between August 2012 and April 2014, and grouped into 'major city' (49%), 'inner regional' (37%), and 'outer regional/remote' (14%) according to the Australian Standard Geographical Classification based on postcode. Multinomial logistic regression analyses were conducted to determine geographical differences in socio-demographic and clinical characteristics, health service use, and perceived barriers to health service access. Results. The 'inner regional group' and 'outer regional/remote group' were more likely to be male (relative risk ratio (RRR)=1.38,95%CI 1.08-1.77 and RRR = 1.60, 95%CI 1.14-2.24) and have no private health insurance (RRR = 1.53, 95%CI 1.19-1.97 and RRR = 1.65, 95%CI 1.16-2.37) than the 'major city group' (49%). However, the 'inner regional group' reported lower pain severity and better mental health relative to the 'major city group' = 0.92, 95%CI 0.86-0.98 and RRR = 1.02, 95%CI 1.01-1.03, respectively). Although rates of health service access were generally similar, the 'outer regional/remote group' were more likely to report client-practitioner communication problems (RRR = 1.57, 95%CI 1.03-2.37), difficulties accessing specialists (RRR = 1.56, 95%CI 1.01-2.39), and perception of practitioner lack of confidence in prescribing pain medication (RRR = 1.73, 1.14-2.62), relative to both groups. Conclusion. Perceived communication, access, and financial barriers to healthcare indicate the need for increased efforts to address geographic inequality in pain treatment.

Keywords

service, health, variation, non-cancer, geographic, opioid, therapy, chronic, adults, pain, receiving, australian, barriers, access, perceived

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Geographic variation in health service use and perceived access barriers for Australian adults with chronic non-cancer pain receiving opioid therapy

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Abstract

Objective: Rates of chronic non-cancer pain are increasing worldwide, with concerns regarding poorer access to specialist treatment services in remote areas. The current study comprised the first in-depth examination of use and barriers to access of health services in Australia according to remoteness.

Methods: A cohort of Australian adults prescribed pharmaceutical opioids for chronic non-cancer pain (n=1,235) were interviewed between August, 2012 and April, 2014, and grouped into 'major city' (49%), 'inner regional' (37%) and 'outer regional/remote' (14%) according to the Australian Standard Geographical Classification based on postcode. Multinomial logistic regression analyses were conducted to determine geographical differences in socio-demographic and clinical characteristics, health service use, and perceived barriers to health service access.

Results: The '*Inner Regional group*' and '*Outer Regional/Remote group*' were more likely to be male (relative risk ratio (RRR)=1.38,95%CI 1.08-1.77 and RRR=1.60, 95%CI 1.14-2.24) and have no private health insurance (RRR=1.53, 95%CI 1.19-1.97 and RRR=1.65, 95%CI 1.16-2.37) than the *'Major City group'* (49%). However, the '*Inner Regional group*' reported lower pain severity and better mental health relative to the *'Major City group'* =0.92, 95%CI 0.86-0.98 and RRR=1.02, 95%CI 1.01-1.03, respectively). Although rates of health service access were generally similar, the '*Outer Regional/Remote group*' were more likely to report client-practitioner communication problems (RRR=1.57, 95%CI 1.03-2.37), difficulties accessing specialists (RRR=1.56, 95%CI 1.01-2.39), and perception of practitioner lack of confidence in prescribing pain medication (RRR=1.73, 1.14-2.62), relative to both groups.

Conclusion: Perceived communication, access and financial barriers to health care indicate the need for increased efforts to address geographic inequality in pain treatment.

Keywords: chronic pain; healthcare; treatment; remote; policy; opioids

Introduction

In Australia, chronic pain is estimated to affect nearly 20% of the adult population (2-5). Chronic non-cancer pain (CNCP) reduces quality of life and impairs physical functioning, sleep, mood, ability to work, and activities of daily living (e.g., walking, shopping) (6, 7), with an estimated cost of AUD$34 billion nationally per annum in Australia (4). Treatments that reduce pain severity and interference can mitigate some of these negative consequences and reduce health care, societal and economic burden (6). The use of opioid pharmacotherapy has increased in recent years, despite insufficient evidence for the effectiveness of long-term opioid treatment for CNCP (8). Australia's consumption of opioid analgesics was ranked 10th globally in 2010, with higher rankings for specific analgesics (3rd and 5th for oxycodone and morphine) (9). Behavioural, psychological and non-opioid pharmacotherapy treatments are also available and demonstrate some efficacy in reducing pain (10-12). As such, current guidelines typically emphasise a multi-disciplinary approach to treatment (13).

Despite the prevalence, recent data indicates that many people with CNCP are not able to access specialist care either in Australia nor internationally, with concern that access problems are amplified in remote geographical areas (14, 15). Higher rates of mortality and morbidity are typically evident for those living in remote areas of Australia relative to those living in urban areas (16). Whilst some self-report population-based studies show similar rates of health service use across remoteness regions (17), analysis of routine administrative data suggests fewer general practitioners and specialists available per capita, and lower rates of health service use (with the notable exception of higher hospitalisation rates), in remote areas (16) . Strategic action plans emphasise addressing these inequalities through updated models of care and health service funding (15). To undertake such action, geographical

77 variation in the experience of CNCP and treatment service access need to be understood, and
78 other factors which may impact on access (e.g., financial barriers, perceived quality of
79 services and treatments, beliefs regarding effects of medications, strategies for coping, level
80 of support) investigated. To date, such undertakings in Australia have generally been focused
81 only on a small sample within a single geographic region, as in the qualitative study by
82 Briggs et al. (18), who identified poor access to information and services and inadequate pain
83 management training as primary barriers to health service access for fourteen participants
84 with chronic low back pain in remote Western Australia.
85
86 As such, the aims of this paper are to:

87 • Compare the socio-demographic and clinical profile of a cohort of adults Australians
88 with CNCP prescribed opioids by geographical remoteness classification (major
89 cities, inner and outer regional, remote and very remote locations);
90 • Compare treatment and health service access according to geographical remoteness
91 classification amongst this cohort; and
92 • Compare barriers to accessing treatment and services (e.g., financial considerations,
93 access and beliefs) according to geographical remoteness classification amongst this
94 cohort.
95

96 # Methods

97 ## Design

98 The Pain and Opioids IN Treatment (POINT) study is a prospective cohort study of 1,514
99 persons in Australia prescribed opioids for CNCP (for a full description of the cohort
100 methodology, see Campbell et al. (19)). The data presented were collected via telephone
101 interview with a researcher, a self-complete survey and medication diary at baseline (August
102 2012 to April, 2014). The self-complete survey and medication diary were completed at
103 home in the week following the telephone interview.

104

105 ## Ethics

106 The study was approved by the UNSW Human Research Ethics Committee (#HC12149). The
107 study also received A1 National Pharmacy Guild Approval to approach pharmacists to assist
108 with recruitment (#815).

109

110 ## Eligibility Criteria

111 Inclusion criteria comprised: 18 year of age or older, competent in English; without apparent
112 memory or other cognitive impairment; living with CNCP (defined as pain present daily for a
113 minimum of three months); and currently prescribed a strong opioid classified as Schedule 8
114 of the Australian Uniform Scheduling of Medicines and Poisons (morphine, oxycodone,
115 fentanyl, buprenorphine, methadone, hydromorphone, and codeine phosphate as a single
116 ingredient) (20) and used this prescribed opioid for more than 6 weeks at the time of
117 admission in the cohort. Exclusion criteria comprised cases where Schedule 8 opioids were
118 prescribed for cancer pain or as opioid substitution therapy for heroin dependence.

119

120 ## Participants and Procedures

From a database of 5,745 community pharmacies, 1,868 were willing to refer potentially eligible participants (19). In total, 35% of pharmacies across all states and territories in Australia agreed to participate. Of those potential participants who were referred (n=2,725), 1,873 were eligible, and a total of 1,514 completed the baseline POINT study interview (201 refused after being deemed eligible and 100 were unable to be contacted). Phone interviews were conducted by research assistants who had a minimum 3-year health or psychology degree. Interviewers had received training in the survey instrument and were provided glossaries of chronic pain medications and conditions. Participants were included in the analyses reported in this paper if they completed both the baseline telephone interview and the self-complete measures including the medication diary (n=1,243); a further eight participants were excluded as they did not provide their postcode (final sample n=1,235).

Measures

Full details of the measures administered in the study are reported elsewhere (19); brief summaries of measures used in the current analyses are provided below.

Demographic and Clinical Characteristics

In addition to demographics, participants reported lifetime pain conditions and pain duration. Participants also completed the Brief Pain Inventory short-form (BPI) (21), and current pain severity and pain interference sub-scores were calculated. Physical and mental health component scores from the SF-12 were calculated; scores were calculated according to standard algorithms, with higher scores indicating better health (22). Depression and generalised anxiety disorder were measured using the Patient Health Questionnaire (PHQ-9) and the Generalised Anxiety Disorder (GAD-7) modules of the Patient Health Questionnaire (23). Symptoms indicating moderate to severe depression were defined as a score of ≥10 on

146 the PHQ-9 (24), symptoms of moderate to severe anxiety were defined as a score of ≥10 on
147 the GAD-7 (25). Post-traumatic stress disorder (PTSD) was measured using the Primary Care
148 PTSD screen (PC-PTSD); a score ≥ 3 was considered indicative of PTSD (26).
149
150 ***Treatment and Health Service Access***
151 Participants were asked about past month prescribed use of pharmaceutical opioids and
152 duration of current continuous episode of opioid use. Oral morphine equivalent (OME) daily
153 doses were estimated using available references (27) based on self-reported opioid use in a
154 medication diary completed over a one week period (included in the self-complete
155 questionnaire mailed to participants). Participants reported the number of times they had used
156 certain health services (general practitioners, ambulance and emergency department services,
157 and hospital day procedures) in the past month. Participants were also asked about past
158 month use of health services directly related to pain, including physiotherapy, medical
159 specialist services, mental health services (i.e., psychiatrist, psychologist, and counsellor);
160 other physical therapies (i.e., massage, Osteopath, Yoga, Tai Chi, Feldenkrais, Pilates,
161 Supervised Exercise, Tens Machine and Bowen Therapy) and complementary and alternative
162 medicines (i.e., chiropractic services, support groups, acupuncture, vitamins and minerals).
163
164 ***Barriers to Treatment***
165 Items assessing barriers to treatment were extracted from previous research (28), and then
166 modified based on feedback from the study's chief investigators and advisory committee.
167 Participants were asked if they had ever experienced particular barriers (yes/no). Barriers
168 included being unable to get to a pharmacy or doctor, being unable to access specialist
169 advice, being unable to afford other types of medication and being unable to afford other
170 treatments (e.g., counselling, physiotherapy, and chiropractor).

171

172 ***Medication Beliefs, Pain Self-Efficacy, Social Support and Alcohol and Other Drug Use***

173 Medication beliefs were assessed by two subscales of the Beliefs about Medications
174 Questionnaire (BMQ) (29): the Specific-Necessity subscale, which assesses the participants'
175 beliefs about the necessity of their current medication, and the Specific-Concerns subscale
176 which measures concerns about prescribed medication. Score range for each scale is 0-25,
177 with higher scores reflecting stronger beliefs. The Pain Self-Efficacy Questionnaire (PSEQ)
178 was administered to assess participants' perceived capacity to perform activities (e.g.,
179 household chores) while in pain and without medication (30), with higher scores (range 0-60)
180 reflecting higher self-efficacy beliefs. The Medical Outcomes Survey (MOS) Social Support
181 index assessed functional support from others; an average score was calculated (range 1-5),
182 with higher scores indicating greater support. Past 12 month use of alcohol, tobacco, and
183 cannabis was also assessed via single self-report items (yes/no).

184

185 **Data Analysis**

186 Participants were grouped by postcode in accordance with the 2006 edition of the Australian
187 Standard Geographical Classification (ASGC) (31) and grouped into three categories based
188 on remoteness of the community of residence: (i) major cities ('*Major City group':* 49%,
189 n=608), (ii) inner regional communities ('*Inner Regional group':* 37%, n=451), and (iii) outer
190 regional, remote and very remote communities ('*Outer Regional*/*Remote group':* 14%,
191 n=176). Although this sample was not intended to be nationally representative, as of June
192 2014, 71% of the Australian population resided in major cities, 18% in inner regional areas,
193 and 11% resided in outer regional, remote and very remote locations (32). Participants were
194 recruited from each state and territory in Australia (Queensland: 33%, n=408; New South
195 Wales: 22% n=267; Victoria: 19%, n=234; South Australia: 14%, n=167; Western Australia:

196 7%, n=90; Tasmania: 4%, n=52; Australian Capital Territory: 1%, n=9; Northern Territory:
197 1%, n=8).
198
199 Data were analysed using multinomial logistic regression conducted in SPSS Statistics v21
200 (33); the referent category was the '*Major City group'*. Results are presented as relative risk
201 ratios (RRR; i.e., the probability of an outcome in one group relative to another).
202 Additionally, relative risk ratios were calculated to compare the '*Inner Regional group'* and
203 *'Outer Regional/Remote group'* in regards to perceived barriers given that these outcomes
204 comprised the primary focus of the study. Percentages with 95% confidence intervals
205 (95%CI) are reported for categorical outcomes, means and standard deviations (M, SD) are
206 reported where continuous data were normally distributed, and medians and inter-quartile
207 ranges (M, IQR) are reported where continuous data show significant skew and/or kurtosis.
208 Adjusted RRR were calculated for health service access; barriers to treatment; medication
209 beliefs; pain self-efficacy; social support; and alcohol and other drug use outcomes. These
210 analyses controlled for age and sex (identified from research showing differences in pain
211 responses based on these characteristics; 34), low income (<AUD$400) and private health
212 insurance, and demographic and clinical variables statistically significant in univariate
213 analyses.
214

Results

Sample Characteristics

The sample (n=1,235) had a median age of 59 (IQR: 49-68) and over half (57%) were female (Table 1). The majority had not completed tertiary education (64%), reported income <AUD$400 (59%), and did not have private health insurance (63%), and nearly half (47%) were currently unemployed. The most common CNCP conditions reported by the sample were chronic neck/back problems (79%), followed by arthritis/rheumatism (68%), and frequent/severe headaches (45%) (Table 1). Participants reported being in pain for a median of 10 years and had been taking pharmaceutical opioids for CNCP for a median period of 4 years.

Differences by Geographical Remoteness

Demographic Characteristics

Compared to the *'Major City group'*, participants in the '*Inner Regional group'* and '*Outer Regional/Remote group'* had greater relative risk of being male and not have private health insurance (Table 1). Further, the '*Inner Regional group'* also reported poorer educational attainment, and the *Outer Regional/Remote group'* were more likely to be younger, than the *'Major City group'*.

Table 1 approximately here

Clinical Characteristics

The duration of living with CNCP and the rate of various CNCP conditions were similar across the geographical remoteness groups (Table 1). The '*Inner Regional group'* reported lower BPI Severity scores, had better mental functioning and wellbeing (as scored on the SF-12), and tended to report lower relative risk of exceeding PHQ-9 and GAD-7 score cut-offs

indicative of current moderate-to-severe depression and anxiety respectively, compared to the *'Major City group'*.

Medication Use

Univariate analyses showed that the groups were similar in regards to length of time in opioid treatment (4 years on average), median opioid dose, and in the distribution of persons receiving a high OME daily dose (15% of the sample ≥200mg/day) (Table 1). The '*Inner Regional group'* had greater relative risk of currently using fentanyl and lower relative risk of using oxycodone and prescription codeine in the past month, and the *'Outer Regional/Remote group'* had greater relative risk of using morphine in the past month, as compared to the *'Major City group'*.

Health Service Access

The majority of the sample had seen a GP in the past month (95%) on a median of two occasions, with no significant difference between the geographical remoteness groups in the number of visits (Table 2). Rates of past month ambulance and emergency department access, and hospital-based day procedures were also similar across the remoteness groups; past month use was 7%, 12%, and 11% of the total sample for each service, respectively. As compared to the '*Major City group*', the '*Inner Regional group'* had a lower relative risk of accessing physiotherapy and mental health services for chronic pain in the past month; these associations were not statistically significant following multivariate analyses. The '*Inner Regional group'* and '*Outer Regional/Remote group'* had two- and three-fold increased relative risk of reporting past month use of other physical therapies as compared to the '*Major City group'* (9% and 15% versus 5%); these associations remained statistically

significant after adjusting for age, sex, income <AUD$400, private health insurance, tertiary education and BPI Severity score.

Table 2 approximately here

Perceived Barriers to Health Service Access

As compared to the '*Major City group'*, the *'Outer Regional/Remote group'* had significantly a greater relative risk of reporting that they: i) felt their doctor was not confident in prescribing pharmaceutical opioids, ii) had communication difficulties with their doctor, iii) were unable to access specialist services, and iv) were unable to afford opioid medication (Table 2). After adjusting for age, sex, income <AUD$400, private health insurance, tertiary education and BPI Severity score, these associations remained significant with the exception of 'being unable to afford opioid medication'. There were no significant differences between the '*Major City group'* and the '*Inner Regional group'* after adjustment for confounding variables.

Calculation of relative risk (RR) to compare the '*Inner Regional group'* and *'Outer Regional/Remote group'* showed that the latter were more likely to report that that they: i) felt their doctor was not confident in prescribing pharmaceutical opioids (RR=1.24, 95%CI 1.07-1.45), ii) had communication difficulties with their doctor (RR=1.22, 95%CI 1.05-1.43), iii) felt their doctor was not listening or did not understand their condition (RR=1.14, 95%CI 1.00-1.31), iv) felt their doctor knew little about pain (RR=1.20, 95%CI 1.02-1.42), v) were afraid they might become dependent on opioids (RR=1.13, 95%CI 1.01-1.26), vi) were unable to access specialists (RR=1.17, 95%CI 1.01-1.35), and vii) were unable to afford medication (RR=1.22, 95%CI 1.01-1.46).

Medication Beliefs, Pain Self-Efficacy, Social Support and Alcohol and other Drug Use

In regards to medication beliefs, the *'Outer Regional/Remote group'* scored significantly higher on the Specific-Concerns BMQ subscale compared to the *'Major City group'* however this association was not statistically significant following adjustment for covariates (Table 3). The *'Inner Regional group'* scored higher on PSEQ and MOS Social Support score (indicating greater pain self-efficacy and social support) as compared to the '*Major City group*'; these associations remained statistically significant in multivariate analyses. Notably, the *'Outer Regional/Remote group'* also reported higher mean PSEQ scores compared to the '*Major City group*' following adjustment for covariates. The '*Inner Regional group'* reported a greater relative risk of weekly or more frequent alcohol use in the past year, and the '*Outer Regional/Remote group*' reported a greater relative risk of weekly or more frequent cannabis use, as compared to the '*Major City group*'; these associations were not statistically significant in multivariate analyses.

Table 3 approximately here

Discussion

Considerable effort has been dedicated to improving health care access for Australians in regional and remote areas, including the National Strategic Framework for Rural and Remote Health (35). This study represents the first detailed examination of remoteness differences in access and barriers to health service use for chronic pain in Australia, a critical undertaking given the increasing prevalence of CNCP and associated health care burden (2).

In regards to demographic and clinical profile, the '*Inner Regional group*' and '*Outer Regional/Remote group*' were more likely to be male and have no private health insurance than the *'Major City group'*; the latter group was also younger than the *'Major City group'*. These findings align with national data showing that private health insurance (i.e., additional healthcare cover to that provided by the Australian government Medicare scheme which is paid for by the individual) is less common amongst residents of high socio-economic disadvantage areas (as generally typified in regional and remote areas), with expense cited as the primary barrier (36). Literature points to greater disadvantage in regional and remote areas, evident via lower incomes (although this finding was not evident in the present study), higher unemployment rates, and shorter life expectancies (16, 37). While the number of people in the current study reporting low income and unemployment did not vary by geographical remoteness, these indicators of disadvantage were considerably higher in this sample overall than reported in the general population (38, 39). Similarly, poor mental and physical health outcomes were elevated overall but generally did not differ significantly across the remoteness groups (with the exception of better mental health outcomes for the '*Inner Regional group*' relative to the *'Major City group'*). These findings suggest that people with CNCP as a group may be characteristed by poorer socio-economic, mental and physical wellbeing.

328

329 In regards to treatment, the '*Inner Regional group'* were more likely to be prescribed fentanyl
330 and less likely to be prescribed oxycodone and prescription codeine, and the '*Outer*
331 *Regional/Remote group*' were more likely to be prescribed morphine, compared to the
332 '*Major City group*' though, despite the difference in prescribing patterns, no difference in
333 dose (represented as OME) was detected. Health service access generally did not differ
334 between the remoteness groups and perceived barriers to health service access were similar
335 for the '*Major City group'* and '*Inner Regional group'* (although the latter reported greater
336 pain self-efficacy and social support). In contrast, the '*Outer Regional/Remote group*' were
337 more likely to report communication problems and lack of confidence in their doctor in
338 treating CNCP, difficulties accessing specialists, and difficulties affording opioid medication
339 (as well as higher pain self-efficacy), relative to both groups.

340

341 These perceived barriers reflect those reported in a study of people with chronic low back
342 pain in rural Western Australia, with patients citing poor access to information and sevices
343 and inadequate pain management training for local practitioners (18). Several population-
344 based studies have shown similar rates of health service access across urban and rural areas
345 with certain exceptions, including poorer specialist access in remote areas (17, 40-42).
346 Indeed, a systematic survey of 57 Australian services providing outpatient care for persistent
347 pain showed lower provision of pain specialist services for remote patients (14). However, it
348 important to note that these studies were conducted prior to, or initially following,
349 introduction of Australia's National Pain Strategy (NPS). The NPS details strategic actions to
350 improve access to information and services, with an emphasis on skilled professionals,
351 evidence-based care, and interdisciplinary pain management (15, 43). Since then, a number of
352 initiatives have been implemented (43), including state-based pain management plans in New

South Wales and Queensland, the Australian Government Medicare-based telehealth program (i.e., support for patient-specialist video consultations), and 14 new regional pain centres (43, 44). Particular emphasis has been placed on training for general practitioners (45) in regional and remote areas given that approximately one-fifth of patients seen in general practice report chronic pain (46). While these endeavours must be acknowledged, the present results indicate that continued efforts are required to address geographic inequality in treatment given the perceived barriers reported by our participants. Indeed, preliminary evidence that certain pain education programs for general health care providers (47) and patients (48) in remote areas in Australia enhance practitioner skills, reduce waitlists, and decrease treatment costs is promising for addressing patient-practitioner communication problems and patient confidence in pain treatment.

Strengths and Limitations

The POINT cohort comprises the largest sample of people with CNCP interviewed in Australia, with a wealth of data regarding a range of domains, particularly physical and mental health, treatment, and health service access (19). Cohort participants were receiving opioid therapy and recruited through pharmacies; thus, some similiarities in health care access and perception of barriers across geographic area are to be expected in the present study. This sample may not be representative of all people who are prescribed opioids for CNCP. It may be that those people with barriers so significant that they cannot even access a prescriber and/or pharmacy may not have been represented in this cohort. However, we have previously compared key characteristics (gender, age and type of opioid) of those enrolled in the study with the characteristics of all customers recorded as purchasing opioids in a random sample of 71 recruiting pharmacies and found striking similarities (49). Specifically, 52% were female (the POINT cohort was 55% female); and 7% were 18-34 years, 55% 35-64

years and 38% 65+ years (vs. 5%, 62% and 33% respectively, in the POINT cohort). Of these customers, 63% were prescribed oxycodone (vs. 62% in the POINT sample), 16.5% prescribed morphine (vs. 15% in the POINT cohort), 21% prescribed fentanyl patches (vs. 15% in the POINT cohort) and 24% prescribed buprenorphine patches (vs. 21% in the POINT cohort). Although it is not possible to determine whether all the opioid customers recorded by these pharmacists had been taking these opioids for chronic pain, and for six weeks or more, the similarities are reassuring. It should be noted a similar geographical breakdown was evident for those participants who were excluded who had provided a postcode ('major cities': 51%; inner regional: 36%; outer regional: 13%) to the final sample used in the present study. It should be noted that those participants excluded due to not completing core measures relevant to this study were more likely to be male (51% versus 43%, respectively) and younger (M=53.6 years, SD=13.5 versus M=58.4 years, SD=13.5) than the final cohort. There are potential biases in self-report, although self-report is generally reliable when there are no disincentives for being honest (50), and participants have been assured of anonymity and confidentiality (as was the case in this study). The percentage of the POINT cohort who reside in outer regional/remote areas is similar to that evident in the general population (14% versus 11%, respectively) (32). However, given the number of participants within the 'Outer Regional/Remote group', we would encourage consideration of the effect size alongside statistical significance for comparisons involving this group given reduced statistical power, and caution in drawing inferences from these analyses.

Conclusion

Despite similar self-reported rates of health service access, participants in outer regional and remote areas were more likely to cite communication problems and lack of confidence in their doctor in treating CNCP, difficulties accessing specialists, and difficulties affording

opioid medication. In order to achieve "knowledgeable, empowered, and supported consumers" of services (Goal 2 of the Australian National Pain Strategy; 15), future strategies must be focused on enhancing the patient experience of treatment and maximising skills and knowledge training amongst health care providers, with a focus on strategies targeted for regional and remote locations.

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Table 1

Demographic and Clinical Characteristics of People with CNCP According to Geographical Remoteness

Outcome[a]	Total Sample (n=1,235)	(A) Major City group n=608	(B) Inner Regional Group n=627	(C) Outer Regional/Remote group n=176	B vs A (ref) [b]	C vs A (ref) [b]
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	RRR (95% CI) *p* value	RRR (95% CI) *p* value
Demographics:						
Age (M, IQR)	59 (49-68)	59 (48-69)	60 (50-68)	57 (47-65)	1.01 (1.00-1.01), p=.289	**0.98 (0.97-1.00), p=.014**
Male	43 (40-46)	39 (35-42)	46 (42-51)	50 (43-57)	**1.38 (1.08-1.77), p=.010**	**1.60 (1.14-2.24), p=.006**
Not completed tertiary education	64 (61-67)	61 (57-64)	69 (64-73)	64 (56-70)	**1.43 (1.11-1.85), p=.006**	1.14 (0.81-1.62), p=.456
Unemployed	47 (44-50)	48 (44-520	43 (38-47)	52 (44-59)	0.79 (0.62-1.01), p=.062	1.14 (0.82-1.60), p=.434
Weekly income <AUD$400	59 (56-62)	57 (53-61)	62 (34-43)	59 (52-65)	1.24 (0.97-1.59), p=.090	1.08 (0.77-1.52), p=.646
Do not have private health insurance	63 (60-66)	58 (54-62)	68 (63-72)	69 (62-76)	**1.53 (1.19-1.97), p=.001**	**1.65 (1.16-2.37), p=.006**
Pain Condition:						
Duration of living in pain (months; M, IQR)	120 (60-252)	120 (48-264)	144 (60-276)	120 (60-204)	1.00 (1.00-1.00), p=0.573	1.00 (1.00-1.00), p=.870
CNCP conditions (lifetime):						
Chronic back/neck problems	69 (77-82)	80 (77-83)	79 (75-83)	77 (71-83)	0.94 (0.70-1.28), p=.707	0.85 (0.56-1.27), p=.414
Arthritis/ rheumatism	68 (66-71)	68 (64-71)	71 (66-75)	64 (56-70)	1.14 (0.87-1.48), p=.340	0.83 (0.59-1.18), p=.306
Frequent/severe headaches	45 (42-48)	46 (42-50)	43 (38-47)	46 (39-53)	0.89 (0.70-1.14), p=.343	1.01 (0.72-1.42), p=.944
Visceral pain	31 (29-34)	32 (28-36)	32 (28-36)	29 (23-36)	0.99 (0.76-1.29), p=.945	0.87 (0.60-1.26), p=.460
Brief Pain Inventory (BPI): Severity score (M, SD)	5.0 (1.8)	5.2 (1.8)	4.9 (1.8)	5.0 (1.7)	**0.92 (0.86-0.98), p=.012**	0.96 (0.87-1.05), p=.329
Brief Pain Inventory (BPI): Interference score (M, SD)	5.9 (2.3)	5.7 (2.3)	5.4 (2.3)	5.7 (2.2)	0.95 (0.91-1.01), p=.088	1.00 (0.92-1.07), p=.900
Health:						
Short Form Health Survey (SF-12): Mental Health score (M, SD)	44.3 (33.2-54.7)	41.8 (32.0-54.0)	46.9 (35.0-55.7)	45.4 (34.7-54.6)	**1.02 (1.01-1.03), p=.002**	1.01 (1.00-1.02), p=.160
Short Form Health Survey (SF-12): Physical Health score (M,	26.5 (22.3-31.3)	26.2 (21.9-30.8)	26.7 (22.7-31.4)	26.4 (23.1-32.07)	1.01 (0.99-1.03), p=.201	1.01 (0.99-1.03), p=.413

SD)						
Depression (PHQ-9 score ≥10)	44 (42-47)	48 (44-52)	40 (35-44)	44 (37-52)	**0.71 (0.55-0.90), p=.006**	0.86 (0.61-1.20), p=.376
Anxiety (GAD-7 score ≥10) ^	22 (20-24)	23 (20-27)	17 (14-21)	27 (21-34)	**0.69 (0.50-0.95), p=.021**	1.24 (0.84-1.82), p=.279
PTSD (Primary Care PTSD Screen score ≥3)	14 (13-16)	16 (13-19)	12 (9-15)	15 (11-21)	0.73 (0.51-1.04), p=.079	0.97 (0.61-1.54), p=.885
Medication Use:						
Median OME daily dose (mg; M, IQR)	73 (36-144)	76 (36-150)	68 (35-126)	66 (31-144)	1.00 (1.00-1.00), p=.124	1.00 (1.00-1.00), p=.793
OME daily dose >200mg^	15 (13-17)	16 (13-19)	12 (10-16)	19 (14-26)	0.75 (0.52-1.10), p=.137	1.25 (0.79-1.98), p=.349
Duration continuous opioid medication (months; M, IQR)	48 (18-120)	48 (24-120)	48 (16-120)	60 (40-132)	1.01 (1.00-1.00), p=.317	1.01 (1.00-1.00), p=.216
Current prescribed opioid medication:						
Oxycodone	60 (57-63)	63 (59-67)	56 (52-61)	60 (52-67)	**0.76 (0.60-0.98), p=.033**	0.88 (0.62-1.23), p=.445
Morphine	15 (14-18)	16 (13-19)	12 (10-16)	22 (17-29)	0.74 (0.52-1.06), p=.099	**1.52 (1.00-2.30), p=.049**
Buprenorphine	23 (20-25)	21 (18-25)	25 (21-29)	22 (16-28)	1.24 (0.93-1.66), p=.142	1.02 (0.68-1.54), p=.915
Methadone	4 (3-5)	4 (3-6)	4 (2-6)	6 (3-10)	0.94 (0.49-1.79), p=.841	1.53 (0.72-3.28), p=.269
Fentanyl	14 (13-17)	13 (10-15)	18 (15-22)	13 (8-18)	**1.51 (1.07-2.12), p=.018**	1.00 (0.60-1.66), p>.999
Tramadol	10 (8-11)	10 (8-13)	8 (6-11)	11 (8-17)	0.73 (0.47-1.12), p=.150	1.11 (0.65-1.89), p=.704
Hydromorphone	4 (3-5)	4 (3-6)	4 (2-6)	3 (1-7)	1.00 (0.53-1.89), p=.991	0.74 (0.28-1.99), p=.555
Prescription codeine	23 (21-26)	26 (22-29)	19 (16-23)	25 (19-32)	**0.70 (0.52-0.94), p=.018**	0.97 (0.66-1.43), p=.895

Note. ^48 participants had missing data for GAD-7 and only 1094 participants provided data to calculate OME. OME: oral morphine equivalent. PHQ-9: Patient Health Questionnaire; GAD-7: Generalised Anxiety Disorder scale; PTSD: post-traumatic stress disorder; RRR: relative risk ratio; 95% CI: 95% confidence interval; M, IQR: median and IQR: interquartile range; M, SD: mean and standard deviation. Bolded values indicate statistical significance (p<.050); italicised variables indicate trend towards statistical significance (p<.100).

Table 2

Health Service Access and Perceived Barriers to Access for People with CNCP According to Geographical Remoteness

Outcome	Total Sample n=1,235	(A) Major City group n=608	(B) Inner Regional group n=451	(C) Outer Regional/Remote group n=176	B vs A (ref)	C vs A (ref)	B vs A (ref)	C vs A (ref)
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	RRR (95% CI) *p* value	RRR (95% CI) *p* value	Adjusted RRR (95% CI) *p* value	Adjusted RRR (95% CI) *p* value
Service Use (past month)								
General Practitioner	95 (94-96)	96 (95-98)	94 (92-96)	94 (89-97)	0.61 (0.34-1.09), p=.097	0.56 (0.27-1.19), p=.130	0.66 (0.36-1.21), p=.178	0.55 (0.26-1.17), p=.121
Number of visits amongst those who had accessed GP (M, IQR)	2 (1-3)	2 (1-3)	2 (1-2)	2 (1-3)	0.97 (0.89-1.05), p=.391	1.01 (0.91-1.11), p=.879	0.99 (0.91-1.07), p=.713	1.00 (0.91-1.11), p=.941
Ambulance	7 (5-8)	7 (5-10)	7 (5-9)	5 (3-9)	0.89 (0.55-1.44), p=.622	0.69 (0.33-1.44), p=.326	0.86 (0.52-1.44), p=.577	0.71 (0.34-1.51), p=.712
Emergency Department	12 (10-14)	11 (9-14)	13 (10-16)	14 (9-20)	1.17 (0.81-1.71), p=.403	1.28 (0.77-2.10), p=.341	1.11 (0.75-1.64), p=.606	1.16 (0.69-1.94), p=.571
Day Procedure	11 (9-13)	12 (10-15)	9 (7-12)	9 (6-14)	0.70 (0.46-1.04), p=.078	0.71 (0.40-1.25), p=.238	0.70 (0.46-1.06), p=.090	0.75 (0.42-1.33), p=.324
Physiotherapy #	16 (14-18)	17 (15-21)	13 (10-16)	19 (14-26)	**0.69 (0.49-0.98), p=.035**	1.13 (0.74-1.74), p=.566	0.83 (0.57-1.19), p=.308	1.39 (0.89-2.17), p=.155
Mental Health Services#	11 (9-13)	13 (10-15)	9 (6-12)	10 (7-16)	**0.66 (0.44-1.00), p=.046**	0.80 (0.46-1.37), p=.414	0.74 (0.48-1.14), p=.172	0.70 (0.39-1.23), p=.213
Specialist Services#	14 (12-16)	17 (14-20)	12 (10-16)	12 (8-18)	0.71 (0.50-1.02), p=.059	0.68 (0.41-1.26), p=.131	0.81 (0.56-1.18), p=.273	0.73 (0.43-1.22), p=.225
Physical Therapies#	8 (7-10)	5 (4-8)	9 (6-12)	15 (10-21)	**1.65 (1.02-2.67), p=.041**	**3.02 (1.75-5.21), p<.001**	**1.66 (1.02-2.70), p=.042**	**2.92 (1.67-5.08), p<.001**
Complementary and	42 (39-	42 (38-	41 (36-45)	40 (33-48)	0.94 (0.74-1.21),	0.92 (0.66-1.30),	0.98 (0.76-1.27),	0.96 (0.67-1.37),

Alternative Therapies#	44)	46)			p=.631	p=.648	p=.885	p=.960
Barriers to Access								
Felt your doctor was not confident in prescribing drugs for pain treatment	19 (17-21)	18 (15-22)	16 (13-20)	28 (21-35)	0.86 (0.62-1.20), p=.379	**1.71 (1.15-2.54), p=.008**	0.96 (0.58-1.36), p=.816	**1.73 (1.14-2.62), p=.009**
Experienced communication problems with your doctor	19 (16-21)	19 (16-22)	15 (12-19)	25 (20-32)	0.79 (0.57-1.09), p=.152	1.48 (0.99-2.20), p=.055	0.87 (0.61-1.23), p=.427	1.47 (0.96-2.23), p=.075
Felt your doctor was not listening/understanding	20 (18-22)	19 (16-22)	19 (15-22)	26 (20-33)	0.98 (0.72-1.35), p=.913	**1.53 (1.03-2.28), p=.036**	1.12 (0.80-1.56), p=.518	**1.57 (1.03-2.37), p=.035**
Felt your doctor knew little about pain	15 (13-17)	15 (12-18)	13 (10-16)	21 (16-28)	0.84 (0.59-1.19), p=.322	1.49 (0.97-2.29), p=.069	0.98 (0.67-1.42), p=.902	1.56 (0.99-2.45), p=.055
Fear you may become dependent on drugs	37 (35-40)	40 (36-44)	32 (28-36)	42 (34-49)	**0.71 (0.55-0.91), p=.008**	1.07 (0.76-1.51), p=.697	0.79 (0.60-1.03), p=.081	1.12 (0.78-1.60), p=.536
Felt your doctor would consider your drug-seeking	11 (9-13)	11 (9-14)	9 (7-12)	15 (10-21)	0.78 (0.52-1.18), p=.241	1.33 (0.81-2.17), p=.263	0.88 (0.57-1.35), p=.543	1.28 (0.76-2.14), p=.357
Unable to get to a pharmacy or doctor	15 (13-17)	15 (13-18)	13 (10-16)	18 (13-25)	0.81 (0.57-1.16), p=.256	1.25 (0.80-1.95), p=.334	0.94 (0.64-1.39), p=.759	1.16 (0.72-1.88), p=.548
Unable to access specialist advice	19 (16-21)	18 (15-21)	17 (14-21)	26 (20-33)	0.97 (0.71-1.35), p=.872	**1.62 (1.08-2.42), p=.019**	1.10 (0.77-1.55), p=.606	**1.56 (1.01-2.39), p=.044**
Unable to afford opioid medication	12 (11-14)	12 (10-15)	11 (8-14)	18 (13-24)	0.87 (0.59-1.29), p=.498	**1.61 (1.01-2.55), p=.044**	0.90 (0.60-1.35), p=.613	1.40 (0.87-2.28), p=.170
Unable to afford other types of medication	21 (19-23)	21 (18-25)	19 (15-23)	26 (20-33)	0.84 (0.62-1.14), p=.267	1.26 (0.85-1.87), p=.247	0.86 (0.62-1.19), p=.354	1.11 (0.73-1.67), p=.639
Unable to afford other treatments (e.g., counselling, physiotherapy)	41 (38-43)	40 (37-45)	40 (36-45)	42 (35-49)	0.99 (0.77-1.27), p=.942	1.06 (0.75-1.50), p=.749	1.06 (0.80-1.39), p=.703	0.95 (0.65-1.38), p=.783

Note. Adjusted analyses (AOR) control for age, sex, current private health insurance, income<$400AUD, tertiary education, and BPI pain severity score. # Note that this data refers only to use of services specifically for pain treatment. RRR: relative risk ratio; 95% CI: 95% confidence interval; M: median; IQR: interquartile range. Bolded values indicate statistical significance (p<.050).

Table 3

Medication Beliefs, Pain Self-Efficacy, Social Support and Alcohol and other Drug Use According to Geographical Remoteness

Outcome[a]	Total Sample n=1,235	(A) Major City group n=608	(B) Inner Regional group n=451	(C) Outer Regional/Remote group n=176	B vs A (ref)	C vs A (ref)	B vs A (ref)	C vs A (ref)
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	RRR (95% CI) *p* value	RRR (95% CI) *p* value	Adjusted RRR (95% CI) *p* value	Adjusted RRR (95% CI) *p* value
Medication Beliefs:								
Medication Beliefs: Specific-Necessity (M, SD)	19.8 (3.8)	19.5 (3.8)	19.8 (3.8)	20.1 (3.5)	1.02 (0.98-1.07), p=.374	1.04 (0.98-1.10), p=.189	1.01 (0.97-1.06), p=.647	1.04 (0.98-1.11), p=.173
Medication Beliefs: Specific-Concerns (M, SD)	14.2 (4.3)	13.8 (4.2)	14.2 (4.5)	14.8 (4.1)	1.02 (0.98-1.06), p=.253	**1.05 (1.00-1.11), p=.039**	1.03 (0.98-1.07), p=.231	1.05 (1.00-1.11), p=.061
Coping and Support:								
Pain Self Efficacy Questionnaire (PSEQ) score (M, SD)	29.9 (13.4)	28.5 (13.5)	31.5 (13.1)	30.2 (13.6)	**1.02 (1.01-1.03), p=.001**	1.01 (1.00-1.02), p=.153	**1.02 (1.01-1.03), p=.001**	**1.02 (1.00-1.03), p=.025**
Medical Outcomes Survey (MOS) Social Support score (M, SD)	3.3 (1.1)	3.2 (1.1)	3.3 (1.1)	3.3 (1.1)	**1.12 (1.01-1.26), p=.041**	1.08 (0.93-1.26), p=.335	**1.13 (1.00-1.27), p=.044**	1.12 (0.96-1.32), p=.155
Alcohol and Drug Use:								
Used alcohol weekly or more frequent (past 12 month)	29 (27-32)	27 (23-30)	33 (29-37)	29 (23-36)	**1.34 (1.02-1.75), p=.033**	1.11 (0.77-1.62), p=.579	1.33 (1.00-1.76), p=.051	1.14 (0.77-1.68), p=.522
Used tobacco daily or more frequently (past 12 months	31 (28-33)	31 (28-35)	28 (24-33)	33 (27-41)	0.86 (0.65-1.12), p=.251	1.09 (0.76-1.56), p=.630	0.76 (0.56-1.03), p=.079	0.79 (0.53-1.18), p=.253

month)								
Used cannabis weekly or more frequently (past 12 months)	6 (5-8)	6 (4-8)	5 (3-7)	10 (7-16)	0.78 (0.45-1.35), p=.372	**1.81 (1.00-3.28), p=.049**	0.62 (0.35-1.11), p=.104	1.19 (0.64-2.23), p=.589

Note. Adjusted analyses (AOR) control for age, sex, current private health insurance, income<$400AUD, tertiary education, and BPI pain severity score. RRR: relative risk ratio; 95% CI: 95% confidence interval; M, SD: mean and standard deviation. Bolded values indicate statistical significance (p<.050).